

### Listing of Claims:

This listing of claims reflects all claim amendments and replaces all prior versions, and listings, of claims in the application. Material to be inserted in amended claims is in **bold and underline**, and material to be deleted is in ~~strikeout~~ or (if the deletion is of five or fewer consecutive characters or would be difficult to see) optionally in double brackets [[ ]].

1-53. (Canceled)

54. (Currently Amended) A method of separating a target material from a liquid mixture, comprising:

forming and at least substantially purifying aggregates ~~of two or more~~ **having a plurality of** crystallites of a magnetizable metal oxide, **wherein the formed and at least substantially purified aggregates have a particle size of about 50 nm to about 500 nm;**

coating the formed and at least substantially purified aggregates with a polysaccharide material to form coated aggregates;

treating the coated aggregates **by attaching a specific binding member having** ~~so that the polysaccharide material has~~ a binding affinity for the target material **to the polysaccharide material** to form treated aggregates;

combining the treated aggregates with the liquid mixture containing the target material for a sufficient time for the target material to bind to the **specific binding member** ~~polysaccharide material~~;

applying a magnetic field to the combination of the treated aggregates and the liquid mixture; and

separating the treated aggregates, including the target material bound thereto, from the liquid mixture, using the magnetic field.

55. (Previously Presented) The method of claim 54, wherein the target material is an inorganic material, an organic compound, or a biological material.

56. (Previously Presented) The method of claim 54, wherein the crystallites have a particle size of about 3 nm to about 25 nm.

57. (Canceled)

58. (Currently amended) The method of claim [[57]] **54**, wherein the ~~treated~~ **formed and at least substantially purified** aggregates have a particle size of about 70 nm to about 450 nm.

59. (Previously Presented) The method of claim 54, wherein the magnetizable metal oxide is a magnetizable iron oxide.

60. (Previously presented) The method of claim 54, wherein the step of forming aggregates of crystallites includes a step of aging the crystallites to increase the size of the aggregates, prior to the step of purifying.

61. (Previously Presented) The method of claim 54, wherein the step of forming aggregates of crystallites includes a step of treating precipitated magnetite with an acid, with a solution of a ferric salt, or with a base to form a colloidal suspension.

62. (Previously Presented) The method of claim 54, wherein the step of forming aggregates of crystallites includes a step of treating precipitated magnetite with

a reactant selected from the group consisting of nitric acid, perchloric acid, a solution of ferric nitrate, and tetramethylammonium hydroxide.

63. (Previously Presented) The method of claim 54, wherein the step of coating the aggregates includes a step of bonding the polysaccharide material directly to the aggregate of crystallites of the magnetizable metal oxide.

64. (Previously Presented) The method of claim 54, wherein the step of coating the aggregates includes steps of bonding an organosilane directly to the aggregate of the crystallites, and bonding the polysaccharide material to the organosilane.

65. (Previously Presented) The method of claim 64, wherein the step of bonding a polysaccharide material to the organosilane includes a step of attaching the polysaccharide material to a pendant functional group on the organosilane.

66. (Previously Presented) The method of claim 54, wherein the step of combining the aggregates with the liquid mixture includes a step of dispersing the aggregates in the mixture.

67. (Previously Presented) The method of claim 54, further comprising:  
dissociating the treated aggregates and the target material, after the step of separating, so that they no longer are bound to one another; and  
removing the treated aggregates using a magnetic field to provide a substantially pure preparation of the target material.

68. (Previously Presented) The method of claim 54, wherein the polysaccharide material has ~~having~~ at least one pendant functional group, and the specific binding member is attached ~~wherein the step of treating the coated~~

~~aggregates includes a step of attaching a coupling group having an affinity for the target material~~ to the polysaccharide material via the functional group.

69. (Previously Presented) The method of claim 68, wherein the pendant functional group of the polysaccharide is a carboxyl group, a carbonate, an amino group or derivatized amino group, an aldehyde group, a sulfhydryl group, or a displaceable group.

70. (Previously Presented) The method of claim 68, wherein the pendant functional group of the polysaccharide is a carboxyl group attached to the polysaccharide through a linker having at least one heteroatom for every three carbon atoms in the linker.

71. (Previously Presented) The method of claim 70, wherein the heteroatom of the linker is oxygen.

72. (Previously Presented) The method of claim 70, wherein the linker is derived from ethylene glycol, an oligoethylene glycol, or a polyethylene glycol.

73. (Previously Presented) The method of claim 70, further comprising introducing the pendant functional group of the polysaccharide by reaction with chloroethoxyethoxyacetic acid and base.

74. (Previously Presented) The method of claim 68, wherein the polysaccharide is dextran.

75. (Previously Presented) The method of claim 68, wherein the coupling group is selected from the group comprising antibody, nucleic acid, enzyme, ligand, epitope, binding protein, and chelate.

76. (New) The method of claim 54, wherein the specific binding member is an antibody, a nucleic acid, biotin, or digoxigenin.

77. (New) A method of separating a target material from a liquid mixture, comprising:

forming and at least substantially purifying aggregates of two or more crystallites of a magnetizable metal oxide;

coating the formed and at least substantially purified aggregates with a polysaccharide material to form coated aggregates, wherein the polysaccharide material includes at least one pendant carboxyl group attached to the polysaccharide through a linker having at least one heteroatom for every three carbon atoms in the linker, wherein the pendant carboxyl group is introduced by reaction with chloroethoxyacetic acid and base;

attaching a coupling group having an affinity for the target material to the polysaccharide material via the carboxyl group, to form treated aggregates;

combining the treated aggregates with the liquid mixture containing the target material for a sufficient time for the target material to bind to the polysaccharide material;

applying a magnetic field to the combination of the treated aggregates and the liquid mixture; and

separating the treated aggregates, including the target material bound thereto, from the liquid mixture, using the magnetic field.